

Wickert et al.
Serial No. 09/893,608

Amendments to the Claims:

This listing of the claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Claim 1 (withdrawn): In a gas turbine electric power generator having a physical speed synchronized to the electrical frequency of a power grid, the turbine including a compressor component having ganged inlet and/or stator vanes which are positioned in accordance with two or more predetermined vane positioning schedules that are a function of turbine physical speed, a method for transitioning between a first predetermined vane positioning schedule and a second predetermined vane positioning schedule, comprising the step of:

varying an angular position of the ganged inlet/stator vanes in a substantially linear fashion with respect to turbine compressor physical speed between a vane position value of a first positioning schedule and a vane position value of a second positioning schedule, wherein the change in angular position of the ganged inlet/stator vanes during a transition in turbine operation between positioning schedules is accomplished in a substantially linear fashion with respect to a change in turbine compressor speed such that an airflow volume consumed by the compressor component is modulated so as to prevent or minimize a decrease in turbine output power.

Claim 2 (withdrawn): A method for controlling the output power of a gas turbine as set forth in claim 1 wherein a transitioning between a first and a second positioning schedule occurs whenever the power grid changes states between a normal operating condition and an under-frequency operating condition or vice versa.

Claim 3 (withdrawn): A method for controlling the output power of a gas turbine as set forth in claim 2 wherein a predetermined nominal vane positioning schedule is used for determining the angular position of the ganged inlet and/or stator vanes during normal power grid operational conditions and a predetermined under-frequency vane positioning

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schedule used for determining the angular position of the ganged inlet and/or stator vanes during power grid under-frequency conditions.

Claim 4 (currently amended): In a gas turbine electric power generator ~~having wherein~~ a ~~physical-rotational~~ speed of the turbine is synchronized to the electrical frequency of a power grid, the turbine having a compressor component ~~using ganged inlet and/or having~~ one or more variable position stator vanes, an actuating mechanism for changing the angular position of the stator vanes and a controller for controlling the actuating mechanism, a method ~~for of implementing a compressor operational strategy for~~ controlling the output power produced by the gas turbine, comprising the steps of:

~~varying-controlling~~ an angular position of the ganged inlet/stator vanes in accordance with a predetermined nominal vane positioning schedule during ~~normal~~ ordinary base load power grid operational conditions;

during an onset of a power grid under-frequency condition, providing a gradual change in angular position of the ~~ganged inlet/stator~~ vanes with respect to compressor physical speed from operating according to the predetermined nominal vane positioning schedule to operating according to a predetermined under-frequency vane positioning schedule; and

varying the angular position of the ~~inlet/stator~~ vanes in accordance with the predetermined under-frequency vane positioning schedule during the power grid under-frequency condition;

wherein the gradual change in angular position of the ~~ganged inlet/stator~~ vanes during a transition in operation from the nominal vane positioning schedule to the predetermined under-frequency vane positioning schedule ~~due to an under-frequency condition is accomplished in a~~ is substantially linear fashion with respect to a change in turbine compressor physical speed ~~such that an airflow volume consumed by the compressor component is modulated so as to prevent or minimize any decrease in turbine output power.~~

Claim 5 (currently amended): A method ~~for of~~ controlling the output power of a gas turbine as set forth in claim 4 further comprising the step of:

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during a ~~return transition of the power grid to normal frequency~~
~~operation~~operational conditions from an under-frequency condition to ordinary base load
operating conditions, providing a gradual change in angular position of the ~~ganged~~
~~inlet/stator vanes~~ with respect to compressor ~~physical speed~~ during a transition in
operation from the predetermined under-frequency vane positioning schedule to the
predetermined nominal vane positioning schedule.

Claim 6 (currently amended): A method ~~for~~of controlling the output power of a gas
turbine as set forth in claim 5 wherein the gradual change in angular position of ganged
inlet/stator vanes during a transition in operation from the predetermined under-frequency
vane positioning schedule to the predetermined nominal vane positioning schedule is
substantially linear with respect to a change in a compressor physical speed, N_{phys} .

Claim 7 (currently amended): A method ~~for~~of controlling the output power of a gas
turbine as set forth in claim 4 wherein the angular position of the ~~ganged inlet/stator~~
vanes is varied with respect to a compressor corrected speed, N_c , ~~where~~according to the
following relationship:

$$N_c = \frac{N_{phys}}{\sqrt{\frac{T_{inlet}}{519}}}$$

where N_{phys} is the compressor physical speed and T_{inlet} = compressor inlet air
temperature.

Claim 8 (new): In a gas turbine electric power generator having a physical speed
synchronized to the electrical frequency of a power grid, the turbine including a
compressor component having one or more stator vanes that are positioned in accordance
with at least one of two predetermined vane angle positioning schedules that modulate an
airflow volume consumed by the compressor component as a function of compressor
rotational speed so as to maintain a constant turbine output power, a method of
controlling gas turbine output power, comprising:

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transitioning between a first predetermined vane positioning schedule and a second predetermined vane positioning schedule in response to an occurrence of a change in operational load conditions of the power grid, wherein an angular position of said one or more stator vanes is changed linearly in response to changes in turbine rotational speed when transitioning between said first positioning schedule and said second positioning schedule.

Claim 9 (new): The method of claim 8 wherein a transitioning between a first and a second positioning schedule occurs whenever the power grid operating load conditions change between a normal operating condition and an under-frequency operating condition or vice versa.

Claim 10 (new): The method of claim 8 wherein a predetermined nominal vane positioning schedule is used for determining the angular position of said one or more stator vanes during normal power grid operational conditions and a predetermined under-frequency vane positioning schedule used for determining the angular position of said one or more stator vanes during power grid under-frequency conditions.